

# **Decision Memorandum on Action and for Application of:**

## **Categorical Exclusion 1.12(or1.13 or both)**

### **Big Thicket Fire Management Plan**

#### **US Department of the Interior National Park Service Inter-Mountain Region Denver, Colorado**

### **Purpose and Need for Action**

Big Thicket National Preserve is located in Southeast Texas. The preserve was established on October 11, 1973 because of biological diversity. Often referred to as a “biological crossroads,” it is a transition zone where southeastern swamps, eastern deciduous forest, central plains, pine savannas, and dry sand hills meet and intermingle. The area provides habitat for rare species and favors unusual combinations of plants and animals. Big Thicket National Preserve was established to ensure the preservation, conservation, and protection of a representative portion of the Big Thicket eco-region. The total area of the site is 99,290 acres, and private lands surround the preserve.

The mission of Big Thicket National Preserve is to assure the preservation, conservation, and protection of the natural, scenic, and recreational values of a significant portion of the Big Thicket Area in the State of Texas, and to provide for the enhancement and public enjoyment thereof (16 U.S.C. 698(a)).

The purpose of developing a fire management plan (FMP) and conducting the associated Categorical Exclusion (CE) for Big Thicket is to evaluate strategies for the management of fire and fuels within the preserve in to protect the resources and values at the site.

The need for action is to revise a fire management plan for a NPS unit to comply with updates to the NPS Director’s Order #18: Wildland Fire Management (DO-18). DO-18 states that “each park with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the Park’s natural and cultural resource objectives and to safety considerations for Park visitors, employees, and developed facilities.” The completion of this new FMP will satisfy these requirements. This plan and the associated CE will establish future management direction for fire-related activities at Big Thicket.

## **Plan Conformation**

The Proposed Action is consistent with any land and resource management plans as required by appropriate Federal, State, or local statutes having a bearing on the decision. The Proposed Action was designed in conformation with all bureau standards and incorporates appropriate guidelines for specific requirements and desired conditions relevant to project activities.

## **Compliance with the National Environmental Policy Act**

The Proposed Action is categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in accordance 516 DM 2, Appendix 1, 1.12 (or 1.13 or both).

Individual fire management units are less than 4,500 acres where hazardous fuels reduction activities and prescribed fire are used, and mechanical methods (crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing) are less than 1000 acres. Hazardous fuels and prescribed fire treatments will also meet the following criteria:

- Are used in the wildland urban interface
- Are approached collaboratively as described in “ A Collaborative Approach For Reducing Wildland Fire Risks to Communities and the Environment 10-year Comprehensive Strategy Implementation Plan”;
- Are conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
- Are not conducted in wilderness areas or impair the suitability of wilderness study areas for the prevention of wilderness;
- And any herbicides or pesticides application to fuels management projects will be covered by other NEPA documentation (individual Preserve Unit environmental assessments)

Furthermore, all post-fire rehabilitation activities (such as tree planting, fence replacement, habitat restoration, heritage site restoration, repair to roads, trails, and repair of damage to minor facilities such as picnic areas) will not exceed 4,200 acres to repair or improve lands unlikely to recover to a management approved condition from wildland fire damage, or to repair or replace minor facilities damaged by fire. All such activities shall be conducted consistent with agency and Department procedures and applicable land and resource management plans, and will not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and shall be completed within three years following a wildfire.

The application of this categorical exclusion is appropriate in this situation because there are no extraordinary circumstances potentially having effects, which may significantly affect the environment. None of the exceptions apply. These extraordinary exceptions are contained in 516 DM 2, Appendix 2.

## Planning Team and Scoping

The NPS identified members of an interdisciplinary planning team (the IDT), which met in November 2002 to discuss project objectives, issues, impact topics, alternatives, and public scoping. The team consisted of 3 members, including specialists in fire management, forestry, and ecology.

This initial ID team planned and set up an external scoping meeting. The park hosted an external scoping workshop at the maintenance facility on December 17, 2002 inviting members of local government and interested agencies to comment on the fire management planning issues and concerns. The external scoping meeting further identified objectives, issues, impact statements and alternatives. Additional members were added to the ID team from interested parties identified in the external scoping meeting: Paul Stone, Temple Inland; Ricky Maxey, Texas Parks and Wildlife.

## Decision and Rationale on Action

The interdisciplinary team decided to implement multi treatment fuel management. This action builds upon current fire management by allowing site-specific mechanical treatments for fuels reduction. Mechanical treatments are described as the use of hand tools or machinery to sever, and/or shred shrub vegetation. The interdisciplinary team has reviewed the plan conformance statement and agrees that these treatments meet the need for action and, the proposed action conforms to the approved land use plan, so no further environmental analysis is required.

### Implementation Date

This project will be implemented on or after 12/31/2004

_____ Art Hutchinson Big Thicket Superintendent	_____ Date
_____ Dave McHugh Big Thicket FMO	_____ Date
_____ Fulton Jeansonne Big Thicket Fire Ecologist	_____ Date
_____ DW Ivans Big Thicket Fuels Specialist	_____ Date

## Administrative Review or Appeal Opportunities

NPS does not have a formal administrative appeals process.

### Contact Person

Concerns should be directed to the Regional Director, 12795 W. Alameda Parkway, P.O. Box 25287, Denver, Colorado 80225-0287

## Five-Year Treatment Plan

Prescribed Burn Schedule								
Fire Management Unit	Year/acres							
	2004	2005	2006	2007	2008	2009	2010	2013
1201+1300+1401	1106		1106			1106		
1501+1701	1401				1401			
+1602+1605+1608+1610+	785			785			785	785
2101	mech	269		269		269		269
2201	mech	96		96			96	96
2301+2302+2303+2401		96		96		96		
2501		61		61		61		61
2601+2602+2701+2702	mech		158		158		158	158
3101+3301+3401		710			710			
3201+3202			169		169		169	
3601			99		99			
3701	85			85			85	85
3702	75			75				
5101		340		340			340	340
5201	600		600		600		600	600
5301+5401	310		310		310		310	
6101								
6201						152		152
6301								
6401			500			500		500
7100						543		
Totals	1070	1572	1336	1022	2046	578	1758	1761

## FIRE AND FUELS MANAGEMENT AT BIG THICKET NATIONAL PRESERVE

### BACKGROUND



D. Herra Survey, Tyler Co.

Fire regime is an important component of most North American ecosystems, as fire is probably the most influential agent of change in temperate forests and rangelands (Mutch and Cook 1996). Fire has helped shape the vegetative structure and biological diversity of North America since plants began to emerge from under the receding flood waters ten thousands of years ago. As forests and grasslands developed, they did so with the presence of fire, both lightning and human caused. It has only been in the last 100 years that technology has helped remove the influence of fire over much of the landscape and effectively eliminate a vital process from these ecosystems. Fire regimes can be described using measures such as frequency of occurrence, size, and intensity of fires that occur within a given area (Agee 1993). Rather than using these measures to discuss fire

regimes, generalizations are typically made, and fire regimes are defined by fire severity categories such as High/Moderate/Low Severity or Non-Lethal/Mixed Severity/Stand Replacement regimes. From a land management perspective, the idea of a fire regime is useful because it helps in understanding how the current ecosystems evolved. This information can be used to maintain and even restore ecosystems, not by the use of untested technologies, but by the application of fire, which was one of the key factors in creating these systems. The Big Thicket was a wilderness that eluded colonization until the late 1800's. Native people, Spanish and French, all lived around the edges of the Big Thicket, but did not live in its interior. Even the push to colonize the territory during Spanish and Mexican rule, and during the Texas Republic favored the more open prairies. Dr. Cozine in his 1979 doctoral dissertation (*Assault on the Big Thicket of East Texas*, pg 105-106) gives the following description of the Big Thicket forest types: "Loggers were originally drawn to Texas by the tremendous stands of loblolly and longleaf pines. Sandwiched between the shortleaf pine forest of Northeast Texas and the loblolly region on the south, the longleaf pine forest resembled an arrowhead thrusting its point from the Sabine River in the East to the Trinity River in the West. It encompassed nearly five thousand square miles of Southeast Texas. The loblolly region covered an additional six to seven thousand square miles. The Big Thicket counties contained millions of acres of both species. Newton, Jasper, Tyler, Polk, and the northeastern area of Hardin County laid within the longleaf district, while the western area of Hardin county and the northeastern part of Liberty County were covered with great stands of Loblolly. In addition to the two pine species, thousands of acres of various hardwoods grew along the waterways of the Big Thicket." A description in the first guidebook of the area published in 1840, George W. Bonnell describes the area as: "little more than a huge pine barren" (*Assault on the Big Thicket of East Texas*, James Joseph Cozine, 1979, pg 81). The pine forest was described as being very open with a grassy forest floor, separated by dense bay-gall drainages called "thickets." William Bartram, a Naturalist traveling the South in the 1770's, said "A level open, airy pine forest, the stately trees shatteringly planted by nature, arising



G&BN Survey, Tyler Co. 1907-1908

straight and erect from the green carpet, embellished with various grasses and flowering plants” (Harper, Bartram’s Travels Page 253-254). Texas’s eminent forest historian Robert S. Maxwell and his colleague Robert D. Baker tell of the virgin tracts of the eastern pineries of that state: “The towering pine forest was almost overpowering. Travelers often described the magnificent pines {probably Longleaf} soaring 100 to 150 feet in the air with bases 4 or 5 feet in diameter. The forest floor under the great longleaf trees was clean, and the forest was...park like...the combination of sandy soil and wood fires had eliminated most competing growth... Majestic trunks pointing skyward, often 50 or 60 feet to the lowest

limb, were a spectacular sight”(Sawdust Empire, College Station Press, A&M University, 1983, pg.5). Historic photographs (Texas Forestry Association Museum, Thompson–Ford Photo Collection) also indicate that there was very little brush, only tree trunks to obstruct your view (the two pictures on this page represent a common view of the upland pine forest in the Big Thicket region in the year 1907). A full canopy shading the forest floor, and periodic ground fires maintained an open forest. Indians and early settlers maintained a free use of fire for improving forage for their open range livestock. The industrialization of the country led to the harvest of all the mature pine forest of East Texas for lumber production. Railroads partnered with timber barons to move the logs on a system of trams (narrow gage rail ways) from the forest to the mills. The cutover lands were left to naturally regenerate. The large-scale opening of the forest floor to sunlight, and the absence of fire allowed brush species to increase. The species composition of the forest changed, as loblolly pine species regenerated more readily than longleaf. Fire was beginning to be excluded from the forest as more people moved into East Texas. By the time the 2<sup>nd</sup> generation forest was being harvested (beginning in the 1940’s) the timber industry had begun to employ the principles of silviculture, replanting the forest with improved varieties of loblolly and slash pines. This second massive opening of the forest canopy allowed more invasions of understory brush species increased understory brush made fire more catastrophic, and fire suppression became the main objective of regional foresters. The Texas Forest Service was established in 1915, with forest protection divisions being organized by 1925 to initiate forest fire protection in the East Texas timber region.

## **Vegetation Communities and Fire**

The Fire Monitoring Program utilizes the vegetation classification described by Harcombe and Marks (1979):

### Uplands

Upland Pine Forest

Sandhill Pine Forest

Wetland Pine Savannah

### Slopes

Upper Slope Pine Oak Forest  
Mid Slope Oak Pine Forest  
Lower Slope Hardwood Pine Forest

### Floodplains

Floodplain Hardwood Pine Forest  
Floodplain Hardwood Forest  
Wetland Baygall Shrub Thicket  
Swamp Cypress Tupelo Forest

### Flatlands

Flatland Hardwood Forest

In the Big Thicket, soils have important effects on vegetation patterns. Marks and Harcombe (1981) feel that vegetation patterns in the Big Thicket are largely determined by soil texture, including those in the fire prone habitats (p. 11). Liu et al. offer that "vegetation change in the absence of fire may not be as dramatic and profound as is sometimes suggested", summarizing long term studies where changes were mostly structural and lacked species replacement (p. 15).

Slopes and Uplands comprise 47,873 acres, or 55% of the Big Thicket. Approximately 28% of this, 13,400 acres, is upland and upper slope forests - the most fire prone habitats of the Preserve. It should be noted that nearly all types within the "Thicket" have the potential to carry fire during drought (personal comm. Dave McHugh). For example, if soil dries well enough, the deep organic peat layer of the Wetland Baygall type (in which there is standing water most of the year) has the potential to carry a fire (Liu et al. 1995, p. 13).

### **Upland Pine Forest**

Chapman (1932) notes that lightning caused fires probably occurred in Southeastern forests and savannas as frequently as three to four years apart. He goes on to state that: five to six years of fire protection may so alter the ecological conditions that seedlings (including longleaf pine) if established, cannot compete with the herbaceous vegetation. With fire exclusion, the slower growing longleaf pine is often shaded out by the faster growing, less fire tolerant loblolly pine (*Pinus taeda*) and shortleaf pine (*Pinus echinata*), as well as some hardwood species. Wright and Bailey (1982) predict that in the absence of fire, longleaf pine forests will gradually succeed to a southern mixed hardwood community dominated by fire intolerant species. Christensen (1981) suggests a 2-8 year fire frequency for this vegetation type.

### **Wetland Pine Savanna**

Wetland Pine Savanna is the most diverse vegetation type in Southeast Texas. In the BITH Hickory Creek Unit: 'low tree density in Savannas appears to be due to fire and periodic droughts' (Streng and Harcombe 1982). The overstory is dominated by scattered longleaf pine

with many shade intolerant, fire adapted forbs in the understory. Dendrochronology studies suggest that natural fire occurs on a 3.9-year return frequency (Glitzenstein and Harcombe 1988). Liu et al. 1995 summarized findings from studies on similar types in South Carolina, that found repeated burning over a long period of time is needed to maintain pine grassland (p. 15). Without fire, tree density may increase and the community could become less flammable and succeed to pine-hardwood types (Streng and Harcombe 1982).

### **Sandhill Pine Forest**

The presence of remnant longleaf pine and xeric oaks suggests that historically low-intensity fires occurred frequently enough to maintain longleaf populations while enabling bluejack oak (*Quercus incana*) and post oak (*Quercus stellata*) to exist in the understory (FMP 1998 p. 25). Rare pyric herbaceous species (described in section **II. Ecological Model**) inhabit Sandhill Pine Forest. Fire supports longleaf recovery, while keeping hardwoods and other intolerant species at lower levels.

### **Upperslope Pine Oak Forest**

This vegetation type shows characteristics that indicate a strong fire influence occurred in the past (Schafle and Harcombe 1983). The importance of shortleaf and longleaf pines in this type points to historical periodic fire. In fact, shortleaf pine reaches its peak importance in this type (Harcombe and Marks 1979). It is reasonable to assume that fire keeps lower slope, fire-intolerant species from encroaching upslope. Fire suppression has resulted in an upslope migration of lower slope species such as loblolly pine, sweet gum and black gum, and has allowed the development of a rather dense hardwood understory and shrub (FMP p. 26).

### **Preserve Fire History**

Big Thicket National Preserve was established in the 1970's from second and third generation industrial forestlands that had a well-established understory vegetative component. At this time, fire management focused solely on suppression. Only remnants of second-generation longleaf pine stands mixed with loblolly and shortleaf existed. Two Southern pine beetle outbreaks swept through the newly acquired Preserve lands in 1976 and 1982, resulting in mortality of significant portions of mature pine forests in the Beech Creek, Turkey Creek, and Big Sandy Creek Units. These areas once again opened the canopy, encouraging brush (particularly yaupon) growth. In some stands the forest floor became dominated by less flammable hardwoods. Without overstory pines to provide needle cast as a surface fuel, the stand becomes somewhat fire resistant during normal burning conditions. However, the thick brush can exhibit extreme fire behavior in drought wildfire conditions by adding more available fuels in a taller vertical arrangement. Preserve staff began pile burning in the late 70's in conjunction with Southern Pine Beetle control work. In the early 1980's prescribed burning began for restoration purposes. Fire dependent ecosystems such as Upland Pine, Pitcher Plant Bogs, and Savannas in the Big Sandy, Turkey Creek, Hickory Creek and Lance Rosier Units were identified for prescribed fire. Eighty-five burns on 25 units have been conducted during the past 23 years. The Pitcher Plant Bog has had the most frequent fire rotation with the 9<sup>th</sup> burn completed in 2003.



Observations indicate that grasses and forbs are being maintained and increasing Longleaf pine is regenerating. Yaupon growth is slowed, having to re-sprout from rootstock after each burn.

Urban Interface is a critical issue due to dense yaupon brush invasion and scattered homes and communities adjacent to the preserve boundary. These areas have not had the frequency of fire to control the brush evasion, creating difficult prescribed burning conditions, and catastrophic threat of wildfire. A Wildland Urban Interface Project was funded in 2002 for an area on the west side of the Hickory Creek Unit. The project used chemical and mechanical treatments to kill and remove mid-story fuels in a 20 acre strip along the boundary and adjacent to the Wildwood subdivision. The project was a result of it's own Environmental Assessment July 2001. A rapid recovery of forbs and grasses to the understory has been observed.

## **LAWS, PLANS, POLICIES, AND AUTHORITIES**

### **Existing Regulations, Guidance, and Plans**

The following regulations and guidance documents relate directly to the completion of a FMP and CE for the preserve.

National Environmental Policy Act (NEPA) – The purpose of NEPA is to encourage productive and enjoyable harmony between man and his environment; to promote efforts, which will prevent or eliminate damage to the environment and stimulate the health and welfare of mankind; and to enrich the understanding of the ecological systems and natural resources important to the Nation. NEPA requirements are satisfied by the successful completion of an environmental impact analysis, such as an EA or an EIS, in addition to a decision document.

Director's Order-12 (DO-12) – DO-12 is the NPS guidance for Conservation Planning, Environmental Impact Analysis, and Decision Making. DO-12 states the guidelines for implementing NEPA according to NPS regulations. DO-12 meets all Council on Environmental Quality (CEQ) regulations for implementing NEPA. In some cases, NPS has added requirements under DO-12 that exceed the CEQ regulations.

NPS Organic Act of 1916 – Congress directed the U.S. Department of the Interior and NPS to manage park units “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (16 U.S.C. § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 U.S.C. § 1 a-1).

Director's Order-18 (DO-18) – DO-18 is the NPS guidance for Wildland Fire Management, which states, “every NPS unit with burnable vegetation must have an approved Fire Management Plan.” DO-18 defines what an approved FMP must include, stressing that “firefighter and public safety is the first priority” and promoting “an interagency approach to managing fires on an ecosystem basis across agency boundaries.” Procedures for completion, review, approval and required contents for FMP's are provided in Reference Manual-18 (RM-18)

In addition to the regulations and orders listed above, other regulations and policies guide the assessment of impacts. These regulations and policies are listed in the “Environmental Consequences” chapter by impact topic. Plans and policies that are already in effect at the preserve must be considered in developing this FMP.

The General Management Plan (1980) is currently being rewritten, but gives overall goal direction to the Preserve's management of resources as addressed in the Resource Management Plan (December 1996) which states: "To preserve, protect, interpret, and where appropriate restore, the Preserve's unique mixture of temperate and subtropical botanical and biological communities." More specifically addressing fire management: "The purpose of the fire management program is to restore vegetation structure and distribution through the natural interaction of fire in the landscape. Land use practices prior to Preserve acquisition (especially fire suppression) have promoted an overabundance of loblolly pine and brush in upland vegetation types and caused significant loss of upland grass/forbs ground cover. Wildfire control and the protection of structures within the preserve, and on adjoining lands, utilize tactics appropriate to the values at risk, fire intensity, and resource damage. Fire management staff and equipment participate in interagency training and fire assignments to foster cooperation, gain skills, and provide resources for emergency response." The fire management plan follows the guidance of GMP and the RMP.

Several other plans and policies may affect or related to fire activities at the preserve. These include a MOU for cooperation with the Texas Forest Service in regional fire suppression activities, a cooperative agreement with The Nature Conservancy to share resources, and a cooperative adjacent landowner agreement with Temple Inland Corp. (a private timber management company)

The following are reference and guidance for fire management:

Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide (August 1998)

Federal Wildland Fire Management Policy and Program Review (1995)

Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDOI/USDA)

- A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan (2002)

## **THE PLANNING PROCESS**

### **Planning Team and Scoping**

The NPS identified members of an interdisciplinary planning team (the IDT), which met in November 2002 to discuss project objectives, issues, impact topics, alternatives, and public scoping. The team consisted of 3 members, including specialists in fire management, forestry, and ecology. This initial ID team planned and set up an external scoping meeting. The park hosted an external scoping workshop at the maintenance facility on December 17, 2002 inviting members of local government and interested agencies to comment on the fire management planning issues and concerns. The following people were present at the workshop:

**Table 1, Interested Parties Notified By Letter of Proposed Action During Scoping**

Ike McWhorter	SFA University
J.H. Walston	Tyler County
Rusty Hughes	Tyler County
C.D. Woodrome	Tyler County
Mark Sahmaunt	BIA - SPRO
Don Sylestine	Alabama-Coushatta, TX
Wendy Ledbetter	The Nature Conservancy
Debbie Flowers	The Nature Conservancy
Craig Rudolph	USDA So. Research St.
Jim McCormick	US Fish & Wildlife Service
Ricky Maxey	Texas Parks & Wildlife
Jim Neal	US Fish & Wildlife Service
Maxine Johnston	Big Thicket Association

The external scoping meeting identified objectives, issues, impact statements and alternatives. Concurrently, consultations with the State Historic Preservation Office (SHPO) were initiated. Based on the responses received and subsequent ID team communications, the action alternatives were refined and finalized and the impact topics were identified prior to analysis. Additional details concerning public scoping and consultation documented for this project are provided in the Consultation/Coordination chapter. Additional members were added to the ID team from interested parties identified in the external scoping meeting: Paul Stone, Temple Inland; Ricky Maxey, Texas Parks and wildlife.

## Objectives of Fire Management Planning

Objectives define what must be achieved for an action to be considered a success. All alternatives selected for detailed analysis must meet all the objectives to a large degree, as well as the purpose and need for action.

Based upon the IDT's review of the project, the following objectives were identified for taking action:

### Objectives From Internal Scoping

The Scoping Team identified objectives from Scoping meeting:

- 1. Provide for the safety of visitors, preserve employees, firefighting staff and the general public as the highest priority.**
- 2. Mitigate wildfire risk in Wildland/Urban Interface zones, and protect preserve developments, cultural resources, and ecologically sensitive areas. (Need to have an evaluation of known cultural resources done, to determine their historical significance and future management objectives. It seems that cultural resources have been found and identified for protection as a result of work done in oil development and general knowledge, but no official assessment or listings have ever been made.)**

3. **Restore and maintain fire's function to promote a natural system, and maintain species diversity and natural patterns of succession on the landscape scale. [Restoration of Longleaf Pine Forest is a high priority]**
  4. **Minimize the effects of fire suppression actions on natural and cultural resources.**
  5. **Improve habitat of sensitive species (in consultation with US Fish & Wildlife).**
  6. **Control exotic species:**
    - [Chinese Tallow a significant problem, an Exotic Plant Crew being hired]**
    - [Feral hog sightings are increasingly frequent]**
    - [Beaver population increasing problem now that fur trapping is down]**
  7. **Improve watershed values by preventing catastrophic fires.**
  8. **Meet federal, state, and local air quality regulations. Change fuel types, to produce less smoke.**
    - [Fire and smoke is locally accepted. Only 2 burning related complaints in 20 years]**
  9. **Activities are cost effective.**
- (See Table 1 for summary results of objectives met in against each alternative.)

**Objectives dismissed:**

10. **Base the fire program on sound data acquired through scientific monitoring, and incorporate the results into resource management planning and execution. (This is an operational guideline and not an objective)**
11. **Assist other federal, state, tribal, and private land management agencies in fire management activities, and manage fire corporately with adjacent property owners. (This is an operational guideline and not an objective)**

**IMPACT TOPICS**

Specialists in the National Park Service, and personnel from local agencies, that attended the internal scoping meeting, identified issues and concerns affecting the proposed action. Impact topics are the resources of concern that could be affected by fire management activities. The following impact topics were identified based upon federal laws, regulations, orders, and National Park Service *Management Policies, 2001*, and from input by the SHPO. A brief rationale for the selection of each impact topic is given below, as well as the rationale for dismissing specific topics from further consideration.

**Native Vegetation and Wildlife**

Fire and associated activities directly impact vegetation and wildlife on both the individual and ecosystem scale.

**Threatened and Endangered Species**

Fire and associated activities directly impact threatened and endangered species on both the individual and ecosystem scale.

#### Exotic Species

Fire and associated activities directly impact exotic species on both the individual and ecosystem scale.

#### Public Safety for Visitors and Adjacent Landowners

Fire must be mitigated to protect visitors and adjacent landowners.

#### Aesthetics

Fire can have both positive and negative impacts on the way things in the preserve look.

#### Soils

Fire and associated activities may impact soil properties and productivity.

#### Air Quality

Emissions from fires may degrade air quality

#### Floodplains and wetlands

Fire associated activities may have both positive and negative impacts on flood plains and wetlands.

#### Cultural resources

Fire and associated activities can potentially harm above ground cultural resources.

## **NATIVE VEGETATION AND WILDLIFE**

Fire management activities were evaluated on the following plant communities as defined by Marks and Harcombe {1981}, and further described in the June 2001 Fire Monitoring Plan:

Upland Pine Forest

Sandhill Pine Forest

Wetland Savannah

Upper Slope Pine Oak Forest

These forest types have been impacted by past land use practices, and the suppression of wildland fires, altering the natural stand structure and diversity. A search of historical records show that East Texas was dominated by the longleaf pine (*Pinus palustris*) ecosystem separated by creeks and river-bottom drainages. These unbroken forests were mostly mature 'old' growth stands with little or no under story brush due to regular annual to biannual fire (Bray, Forest Resources of Texas pp.22-23, J.H.Foster, H.B. Krausz, George W. Johnson, Forest Resources of East Texas, Texas A&M College, Department Of Forestry Bulletin, no. 5 (1917)). A great diversity of plants thrived, with some estimates of 40 species in a square meter. Species diversity is the highest reported in North America (Westoff 1983). Burned areas contained seven times more plants valuable to wildlife than unburned areas. Fire in these ecosystems substantially increased protein content, nutrients, and food. (Southern Forest Resource Assessment Technical Report, Chapter 24, Back Ground Paper, 4.8 Biological Evidence for

Native Burning; Wayne D. Carroll). This landscape supported diversity and abundance of wildlife, such as deer, turkey, bear, elk, bison, wolves, mountain lions, and a myriad of smaller mammals. Non-migratory and migratory birds were abundant through out the region. Early writers talk about the abundance of passenger pigeons, where flocks in flight would literally block out the sun. A century of logging, ownership divisions and the exclusion of fire has changed the forest into a patchwork of age classes, with combinations of native and exotic plants. The prior owners of the persevere lands, predominately the Temple and Kirby timber companies, harvested the lands at least twice, regenerating the longleaf stands with mixed pine stands of longleaf, loblolly, and southern hardwood species. Yaupon and other hardwood brush has become dominant in the understory of most upland stands, interrupting the reproduction of longleaf pine, and shading out annual plants [natural bluestem grasses & forbs]. In the South Coastal Plain, the once dominant fire dependent longleaf pine type now occupies less than 3 percent of its original range (Landers and others 1995, cited in: Southern Forest Resource Assessment Technical Report, Chapter 24, Back Ground Paper, 4.11 Potential Forest Vegetation, Wayne D. Carroll).

#### THREATENED AND ENDANGERED SPECIES

Natural habitat is needed to maintain normal animal populations. Many are fire dependent communities, especially the Red Cockaded woodpecker (*Picoides borealis*) and Bachman's sparrow (*Aimophila aestivalis*). Both threatened and endangered species. Their decline can be directly linked to the loss of pyric vegetative communities. The Red Cockaded woodpecker nest in live mature pine trees, taking up to 3 years to bore nesting cavities. Cavity building is aided by the presence of red heart fungi in old growth longleaf. RCWs must have an open mid-story to forge in and protect their cavities from invasion by their primary predator the chicken snake. Regular occurrence of fire in the pine under-story prevents hardwoods from growing into the mid-story. The Bachman's sparrow: Reintroduction of once common species like the wild turkey, and Bob White quail can only be successful in upland pine forest with open under story. These birds are dependent upon the grasses and forbs associated with regular burning for food, breeding, and predator protection.

#### EXOTIC SPECIES

Chinese tallow (*Sapium sabiferum*) and other aggressive exotics have been introduced and become prolific competitors for light moisture and nutrients. Timber companies planted slash pine (*Pinus elliottii*), an exotic species, as fast growing timber on sandy sites replacing longleaf pine. Some xeric sandhill rare plant communities that support Blue Jack Oak (*Quercus incana*) and Texas Trailing Phlox (*Phlox nivalis* ssp. *texensis*) were planted with slash pine.

### **PUBLIC SAFETY FOR VISTITORS AND ADJACENT LANDOWNERS**

The historic impact of fire on preserve visitors has been mostly positive, although trail closures, hunters benefit from the wildlife habitat improvement, but are restricted from burn areas during a prescribed burn. Adjacent landowners are affected by boundary access, fire lane construction, resource protection, and risk reduction. Neighboring communities are protected from wildfire escapes, and benefit from fuel reduction, but may be inconvenienced by the periodic smoke. The

local workforce may be impacted by the typical fire lane construction and increased mechanical vegetation manipulation treatments.

## **AESTHETICS**

Blackened tree trunks and top killed vegetation skeletons associated with fire affect to the look of the forest and are issues for some. The absence of fire also affects the look of the forest by allowing dense midstory brush to obscure any depth of view and dissuade visitors from venturing off trails.

## **SOILS**

The Soil Conservation Service completed a soil survey for the preserve in 1978. The survey describes the soils of the area: “ The soils of the area formed under forest. They are dominantly light colored and loamy. Some are wet, and a few are ponded. Some clayey soils are found along the Neches River. Erosion is a minor problem.” There are 46 different soil types within the Big Thicket Preserve, with each soil type rated for: building development, sanitation facilities, construction materials, recreation development, wildlife habitat, woodland management productivity, woodlands understory vegetation, soil texture, physical properties, soil and water features. Much of this information is very useful for making site-specific restoration prescriptions. In general, fire does not change soil properties since the soil itself does not burn. Soil properties do affect vegetation growth and moisture content of fuels. Soils can be sterilized for a period of time from catastrophic fire in drought conditions. Associated fire management activities such as mechanical fuel manipulation can have adverse effects on soils in the form of rutting.

## **FLOODPLAINS AND WETLANDS**

Water run off from recently burned upland forest are an issue when considering flood plains and wetlands. The movement of soil from line construction can affect water quality. Pine savannahs are a many times wetland ecosystem and dependent on fire to exist. All the above are mitigated leaving unburned areas adjacent to streams to act as filters and use of water control devices in fire lane construction.

## **CULTURAL RESOURCES**

The impacts to cultural resources are generally minimized by a soil covering, or are known surface sites and may be excluded from planned ignitions. Each fire management plan has a Protection of Special Features section that defines these issues.

## **Issues and Impact Topics Considered but Not Further Addressed**

Several issues and impact topics were considered during external and internal scoping, but were eliminated from further analysis. The following issues and impact topics were eliminated for the reasons provided below:

### **VEGETATION TYPES ASSOCIATED WITH FLOOD PLAINS AND LOWER-SLOPE HARDWOOD**

Plants and animals associated with flood plains and lower slope hardwoods are excluded from consideration as they rarely carry a fire, and are generally not a fire dependant community. These plant communities are less flammable, and are not dependent on fire to maintain ecological balance. During drought conditions stand replacement fires can occur, though typically on a small scale. These communities are typically used as natural fire barriers, and limited suppression actions are used to reduce wildfire size during droughts.

### **RESEARCH PLOTS**

Special research plot work on the preserve was considered but dismissed as an operation issue to be addressed in each site specific area where plot work is being done.

### **SLOPES WITH SEEPS**

Slopes with seeps are not generally affected by fire because of their wet nature, although sensitive issues like these are considered in each site-specific burn plan.

### **NOISE SHED**

Noise shed analysis was considered as an objective, but rejected since there is no place on the preserve where outside noise does not penetrate, and the fire program is not inherently noisy.

### **PRESERVE CONCESSIONS**

Preserve concessions were considered, but there are no concessions at this time that would be effected by the burn program.

## **PRIME AND UNIQUE FARMLANDS**

In August 1980, the Council on Environmental Quality (CEQ) directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. The Preserve's enabling legislation did not promote the purchase of farmlands, and management policies prohibit agricultural uses. According to NRCS some of the soils in the project area are classified as prime and unique farmlands, but none of the past practices or proposed actions of the fire management plan will adversely effect these prime farmland soils. Therefore this category was eliminated from further analysis.



## **SOCIOECONOMIC ENVIRONMENT**

The proposed action would neither change local and regional land use, nor impact local businesses or other agencies in a negative way. There will be an increase in opportunities for contractors to do mechanical work. Recreational appeal may slightly increase due to accessibility of an open under story. Therefore, socioeconomic environment will not be addressed as an impact topic in this document.

## **ENVIRONMENTAL JUSTICE**

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Environmental Justice Guidance (1998). Therefore, environmental justice was dismissed as an impact topic in this document.